

Investigating the maths inside:

Modelling climate changes

Activity 2

200 kilometres away



How does rainfall vary over Australia?

What is the best way to model this?

# Introduction

The scientists in the video describe dividing up the surface of the earth into 200 km squares. The study of the differences in rainfall over those 200 km squares can lead to a better understanding of how predictions about future climate possibilities are made, and the difficulty of making predictions from taking averages of averages over a particular area.

(A 200 kilometre square has sides of 200 km and an area of 40 000 square kilometres, whereas a square with an area of 200 square kilometres would have a side length of approximately 14 km)

**How much difference in the rainfall?**

## Places 200 km away

Make some suggestions of places that are approximately 200 kilometres from your school. Use Google maps to confirm or improve your suggestions.

What difference do you think there might be in the annual rainfall for those places? Make some estimates and explain your thinking.

Find the actual annual rainfall information for where you live and some of the places 200 kilometres away. How close were your estimates? What other information would have helped?

Where are the driest and wettest places in Australia? What is their rainfall (in mm)? How does this compare to the rainfall at your school?

## Choose two weather stations

Use the Bureau of Meteorology website (<http://www.bom.gov.au/climate/data/index.shtml> ) to find the rainfall data for the nearest weather station to your school, and rainfall data for the nearest weather station to **one** of the places that you chose.

Arrange the data into the table shown below.

|  |  |  |
| --- | --- | --- |
| **Month** | **Rainfall (my school)** | **Rainfall (200 km away)** |
| **January** |  |  |
| **February** |  |  |
| **March** |  |  |
| **April** |  |  |
| **May** |  |  |
| **June** |  |  |
| **July** |  |  |
| **August** |  |  |
| **September** |  |  |
| **October** |  |  |
| **November** |  |  |
| **December** |  |  |
| **Total** |  |  |
| **Average** |  |  |

What do you notice about this information? Are the figures very similar or widely different? What would be the effect of making a model using the average of these data?

# Dividing up Australia

How many 200 km squares would be needed to cover the whole of Australia?

Estimate and then find a way to check your answer.

Draw the squares onto your map of Australia. You will need to consider scale and how you might arrange the squares.

Are there any squares that you think will have different annual rainfall averages to your school? Colour the ones that you thing will be higher, and (in a different colour) the ones that you think will be lower.

According to the Bureau of Meteorology website the long term average rainfall for Australia is 465.2mm. How do you think this figure is arrived at? How does this compare with the average rainfall you found in the table above?

What further information is required to make predictions about rainfall into the future?